

Appendix A

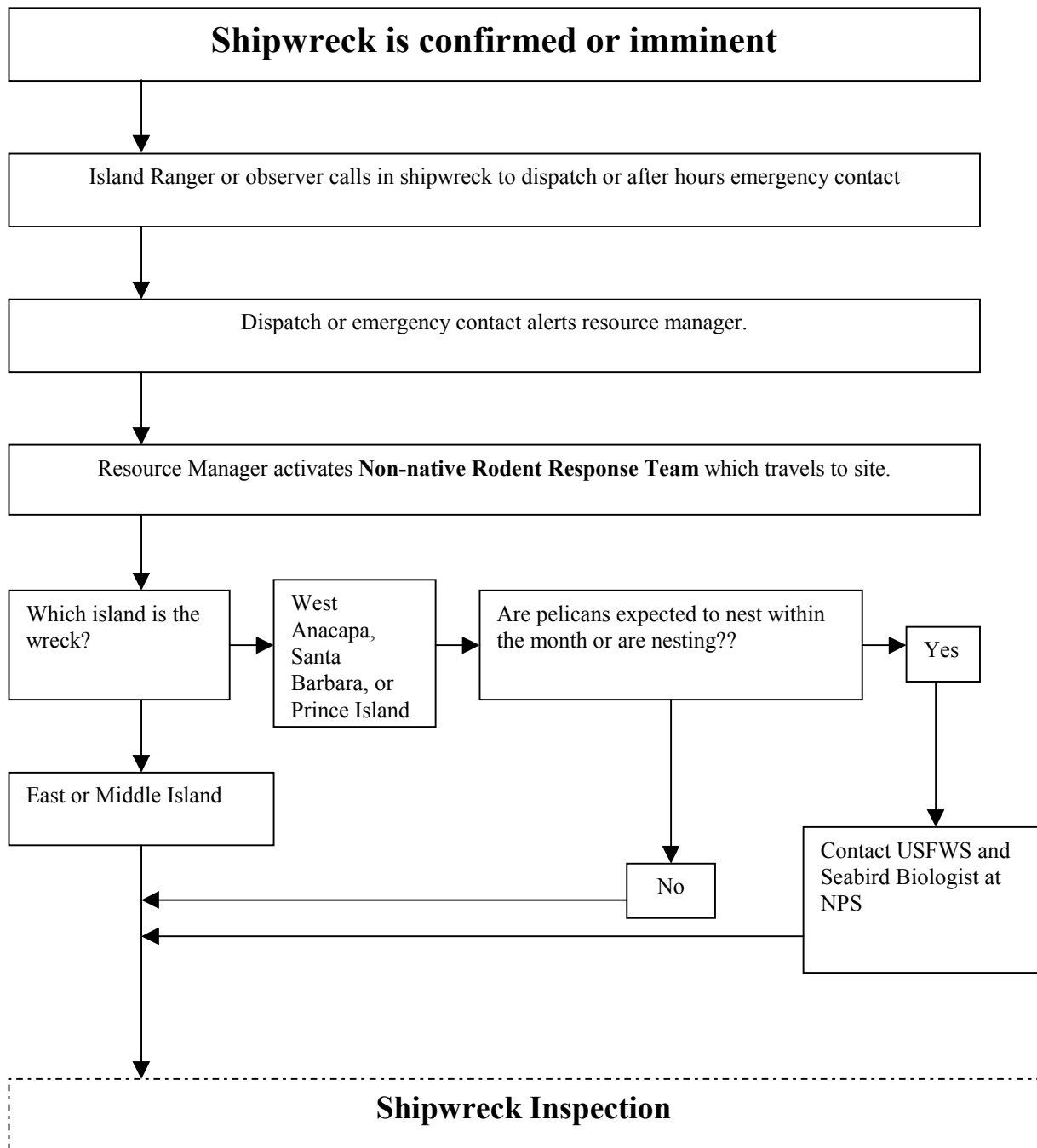
This appendix is divided into two sections: the Shipwreck Response Plan and the Rat Detection Response Plan. Each of the response plans are in flowchart form, designed for ease of reading and required steps to implement an eradication. The objective of this document is to provide a pathway for managers and personnel to successfully implement the eradication of introduced rodents. This flow chart is designed to serve as a guide for immediate action. However, the recommended actions should be followed up as soon as possible by a meeting of the AIRP working group to examine the available information and design the best possible plan. The Shipwreck Response Plan is designed to direct actions of managers and personnel toward implementing the Rat Detection Response Plan. Once rats are confirmed on the islands, the Rat Detection Response Plan directs personnel and managers toward a resolution, i.e., eradication of the introduced rodent. If rats would be introduced via transport of equipment or goods, the Rat Detection Response Plan would be implemented, bypassing the Shipwreck Response Plan.

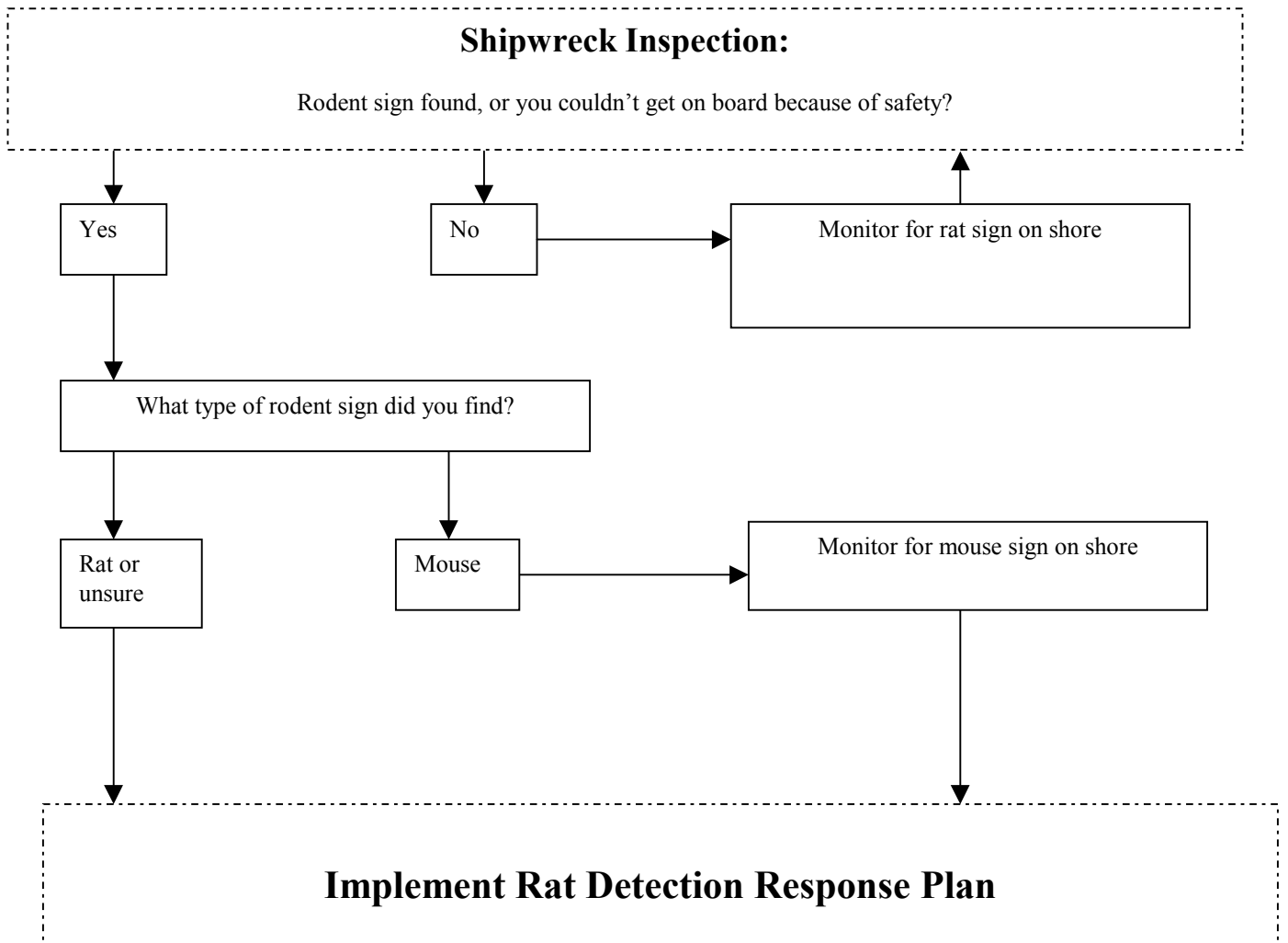
The plans follow on the next pages.

AIRP: Shipwreck Response Plan

Objective: The objective of this plan is to provide a pathway for managers and personnel to respond to shipwrecks that potentially could introduce non-native rodents to Anacapa Island.

Instructions: Follow the flowchart to implement an appropriate action. A description for each box is attached. Be clear about each step before moving on.

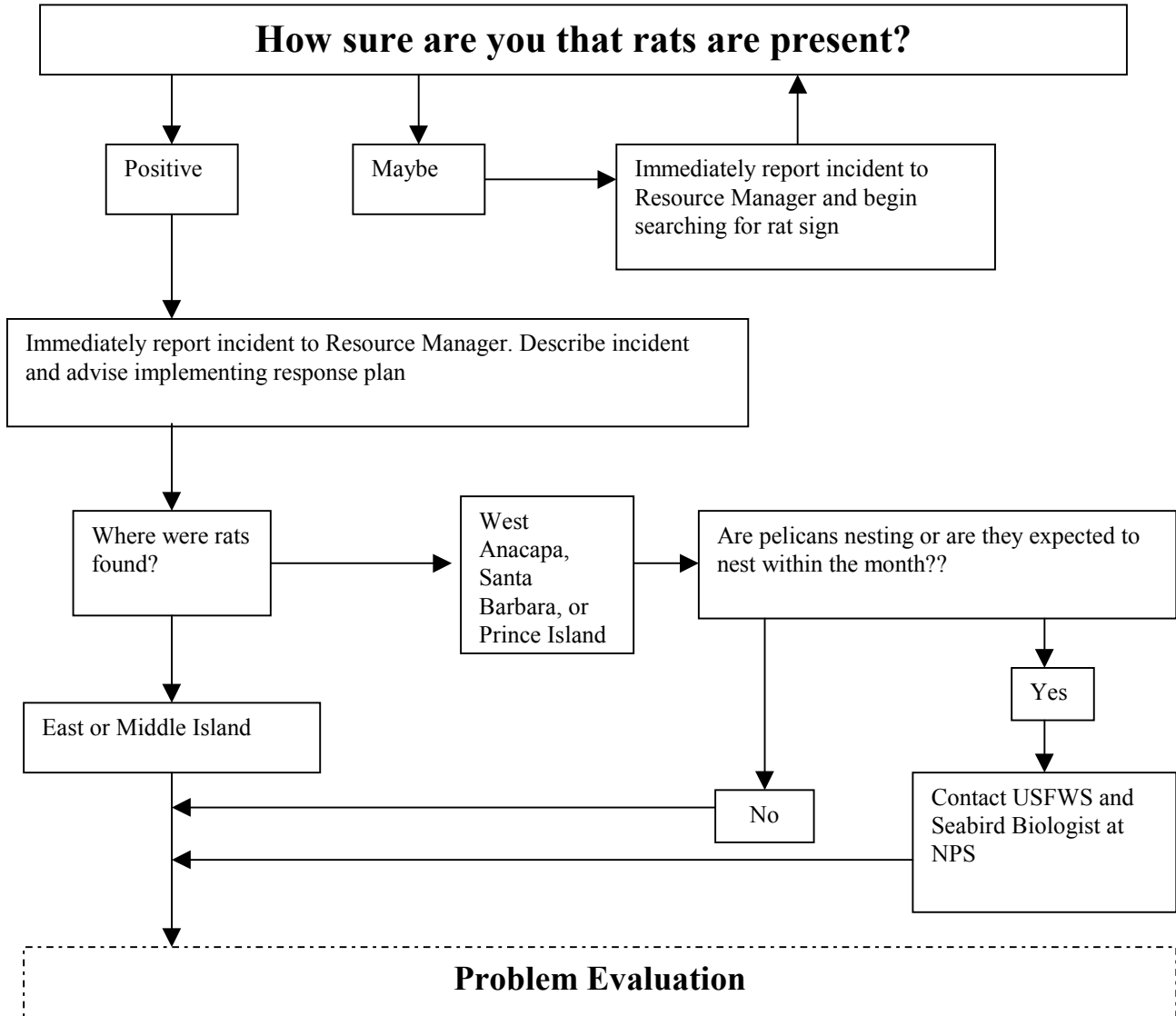


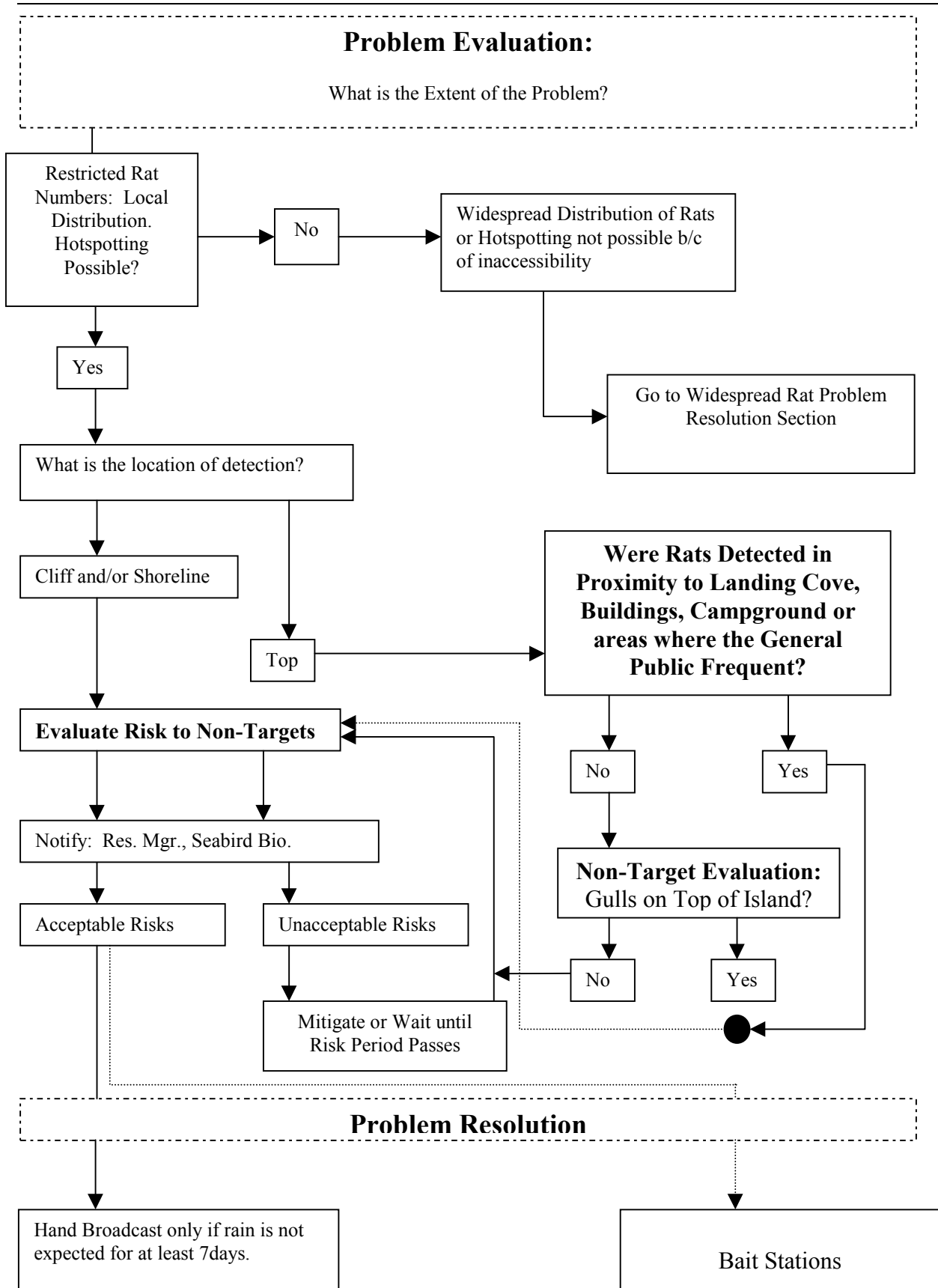


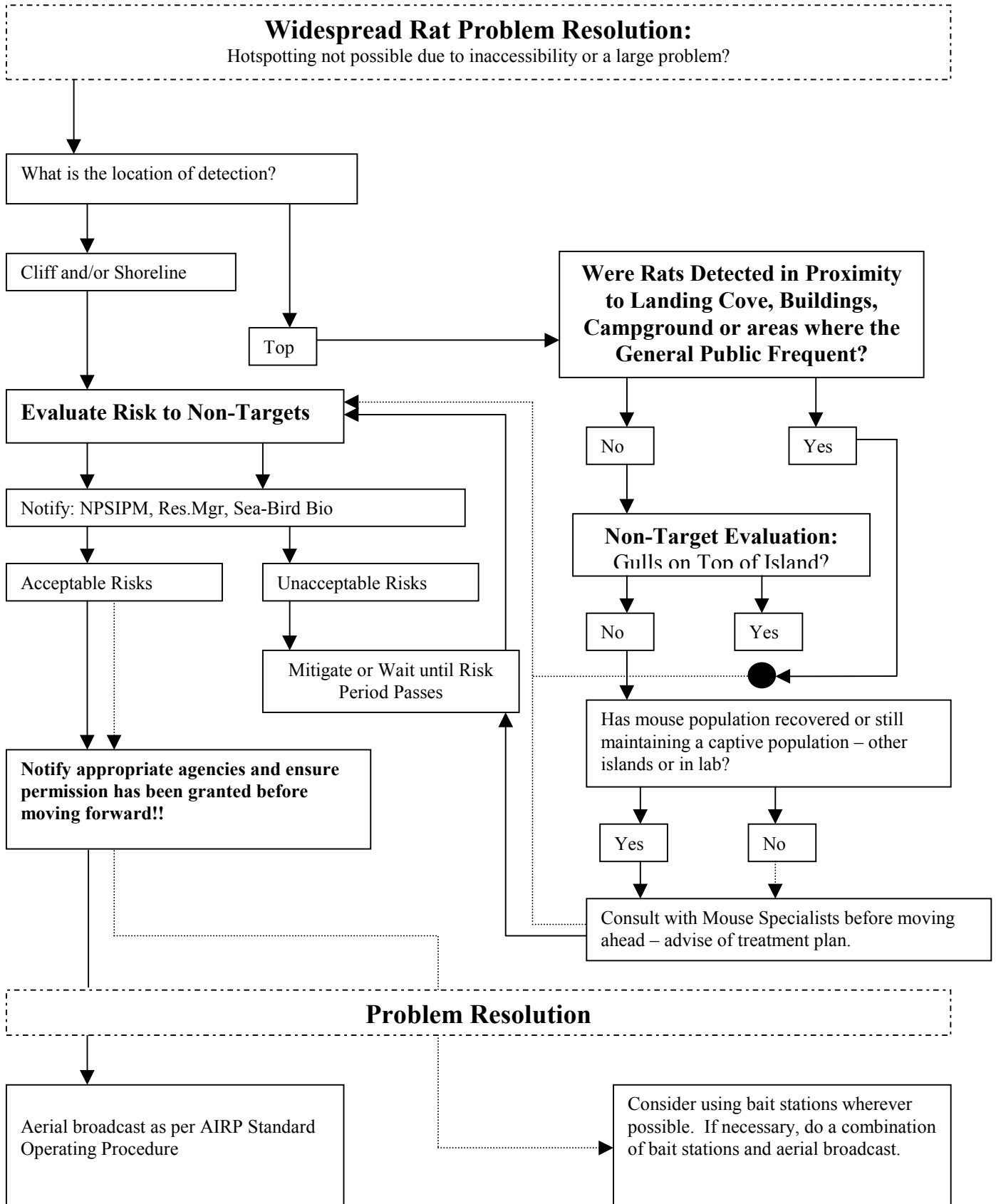
AIRP: Response Plan for Positive Detection of Rats Post Eradication

Potential Situation: Rats have been detected due to incidental introduction or shipwreck. Tools and budgets necessary are available.

Instructions: Follow the flowchart to implement an appropriate action. Be clear about each step before moving on.







Appendix B

The Birds of Channel Islands National Park

(adapted from: Jones et al. 1985)

Symbols:

Abundance: a – abundant; c – common; u – uncommon; o – occasional; r – rare; x – accidental

Seasonal Occurrence: FR – former resident; FT – fall transient; FV – former visitor; IR – introduced resident; R – resident; SR – summer resident; ST – spring transient; SV – summer visitor; V – visitor; WV – winter visitor

- - breeds on islands noted.

	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island
LOONS					
Red – throated Loon	oWV	uWV	uWV	oWV	oWV
Pacific Loon	cWV oSV	aWV oSV	cWV	uWV	cWV
Common Loon	cWV oSV	cWV	uWV	oWV	oWV
GREBES					
Horned Grebe	uWV	cWV	uWV		
Eared Grebe	aWV oSV	aWV oSV	aWV	aWV	aWV
Western Grebe	uWV	cWV	cWV	oWV	oWV
ALBATROSSES					
Black – footed Albatross	rV		rV		
SHEARWATERS					
Northern Fulmar	oWV	uWV	uWV	oWV	oWV
Pink – footed Shearwater	oSV	oSV	oSV	oSV	oSV
Sooty Shearwater	uSV	uSV	uSV	uSV	uSV
Black-vented Shearwater	rWV		rFT		rFT
STORM-PETRELS					
Leach's Storm-Petrel*	uSR				
Ashy Storm-Petrel*	cSR		uSR		cSR
Black Storm-Petrel*					cSR

TROPICBIRDS					
Red-billed Tropicbird	rSV		xFT	xST	xFT
PELICANS					
Brown Pelican	aV	aV	rR*	aR*	aR*
CORMORANTS					
Double-crested Cormorant	cR*	cV	cR*	cR*	cR*
Brandt's Cormorant*	aR	aR	aR	aR	aR
Pelagic Cormorant*	cR	cR	cR	cR	uR
FRIGATEBIRDS					
Magnificent Frigatebird	xST			rSV	xSV
HERONS, EGRETS, BITTERNS					
Great Blue Heron	oV	uV	uV	oV	oV
Cattle Egret	xWV	oWV	oWV	oWV	rWV
Green-backed Heron			oST	xFT	
Black-crowned Night-Heron		xWV	oFT rST		xST
GEESE, DUCKS					
Greater White-fronted Goose		oFT		FV	
Snow Goose	xWV	oWV	oWV	xFT	
Brant	rWV	oWV	oWV	xST	oST
Canada Goose	xWV	oWV	oWV		rWV
Wood Duck			rFT		
Green-winged Teal		cWV	oWV	xWV	
Mallard		oWV xSV	oWV		
Northern Pintail	xSV rFT	cWV	oWV		xFT
Blue-winged Teal		oFt oST	oFT oST		
Cinnamon Teal	xFT	uWV	uWV	xFT	
American Wigeon		cWV	xFT		
Surf Scoter	aWV oSV	aWV oSV	aWV oSV	aWV	cWV
White-winged Scoter	cWV	cWV	cWV	oWV	rST
Red-breasted Merganser	uWV	oSV uWV	uWV	oWV	xST
Ruddy Duck	rFT	oWV	xSV		
OSPREY, HAWKS, EAGLES					
Osprey	rFT		oFT xST	rFT rST	rFT
Bald Eagle	FR	FR oWV	FR	FR	FR xV
Northern Harrier	oWV xSV	oWV xSV	oWV	oWV	oWV

	Sharp-shinned Hawk	oFT	oWV	uWV		
	Cooper's Hawk	oFT	oWV	uWV		rFT
		oST				
	Red-tailed Hawk	uR*	uR*	uR*	uR*	xSV uWV
	Golden Eagle	xV	rV	oWV		
FALCONS	American Kestrel*	uR	cR	cR	uR	uR
	Merlin	rFT	oWV	oWV		xST
		rST				
	Peregrine Falcon	FR	FR	FR	FR	FR
		uIR*	oV	oV	oWV	oWV
PHEASANTS, TURKEYS, QUAIL	Chukar*		uIR			
	Common Peafowl*			uIR		
	Wild Turkey*			uIR		
	California Quail*		cIR	cIR		
RAILS, COOTS	Virginia Rail			rWV		xFT
	Sora		xFT	oST	xST	xSV
	American Coot		xWV	uWV	uWV	rFT
				xSV+		
PLOVERS	Black-bellied Plover	aWV	aWV	cWV	rWV	uWV
		uSV	uSV	uSV		
	Lesser Golden-Plover	oV	xFT	xWV		xST
	Snowy Plover	cR*	cR*	cR*		xST
	Semipalmated Plover	oWV	oFT	oFT		xFT
			oST	oST		
	Killdeer	oFT	cR*	cR*	oFT	rST
		rST				
	Mountain Plover	FV	oWV			
OYSTERCATCHERS	American Oystercatcher			rR*	xR+	xSV
	Black Oystercatcher*	cR	cR	cR	cR	cR
SANDPIPERS, PHALAROPES	Greater Yellowlegs	oFT	oFT	oFT	xFT	
		oST	oST	oST		
	Solitary Sandpiper	xFT	xFT	oFT	xFT	
	Willet	cWV	aWV	cWV	uWV	uWV
		uSV	uSV	uSV		oSV
	Wandering Tattler	cWV	cWV	cWV	cWV	cWV
		uSV	oSV	oSV	uSV	uSV
	Spotted Sandpiper	oWV	oWV	uWV	uWV	oST
						oFT
	Whimbrel	cWV	cWV	cWV	oWV	cWV
		uSV	uSV	uSV		uSV

Long-billed Curlew	oV	uWV	oFT oST		uSV
Marbled Godwit	uWV oSV	cWV uSV	uWV oSV		rST
Ruddy Turnstone	cWV	cWV oSV	uWV oSV	oST	oFT oST
Black Turnstone	aWV uSV	aWV oSV	cWV uSV	cWV	uWV oSV
Surfbird	rST	oFT	xST	rFT rST	xST
Sanderling	cWV	aWV oSV	aWV oSV	xFT	rFT
Western Sandpiper	oFT oST	uWV	oFT oST	oFT	xST
Least Sandpiper	uWV	cWV	oWV	xFT	rFT rST
Baird's Sandpiper		rFT	xFT		
Pectoral Sandpiper	rFT	oFT	xFT		xFT
Dunlin	oFT	uWV	oWV	xST	
Short-billed Dowitcher	rFT rST	xSV	xFT	xFT	xST
Long-billed Dowitcher	xFT	oWV		xFT	
Common Snipe		rFT rST	uWV	xFT	rFT
Red-necked Phalarope		oST oFT	oST	oST oFT	
Red Phalarope		oST oFT	oST	oSt oFT	
JAEGERS, GULLS, TERNS					
Parasitic Jaeger		xWV	oV	oV	
Franklin's Gull	xST			rFT rST	xST
Bonaparte's Gull	oWV	uWV	uWV	oWV	oWV
Heermann's Gull	cWV oSV	aWV oSV	aWV oSV	cWV oSV	uWV oSV
Mew Gull	uWV	uWV	cWV	uWV	
California Gull	cWV	cWV	cWV	uWV	uWV
Herring Gull	uWV	uWV	uWV	xST	oWV
Western Gull*	aR	aR	aR	aR	aR
Glaucous-winged Gull	cWV	oWV	oWV	oWV	oWV
Black-legged Kittiwake	uWV	uWV	uWV	uWV	uWV
Royal Tern	cWV	cWV	cWV	oWV	oWV
Forster's Tern	xFT	oFT		xST	
AUKS, MURRES, PUFFINS					
Common Murre	oWV FR	uWV	uWV	uWV	xST
Pigeon Guillemot*	cSR	cSR	cSR	uSR	cSR
Xantus' Murrelet*	uSR		uSR	uSR	aSR

Cassin's Auklet	aR*	oV	uR*	oV	uR*
Rhinoceros Auklet	oWV	oWV	oWV	oWV	oWV
Tufted Puffin	FR	rV	FR	FR	FR
	xSV				
PIGEONS, DOVES					
Rock Dove	oV	oV	oV	oV	oV
Band-tailed Pigeon	oST	oST	uWV		oSV
	xSV				
White-winged Dove	xFT	rFT		rFT	rFT
		xWV			rST
Mourning Dove	cSV	cR*	cR*	cSV	cSV+
				rWV	rWV
BARN-OWLS					
Common Barn-Owl*	uR	uR	uR	uR	uR
TYPICAL OWLS					
Burrowing Owl	uWV	uWV	uWV	uWV	uR*
Long-eared Owl	oWV	xST			oV
Short-eared Owl	rWV	uWV			uR*
Northern Saw-whet Owl			uR*		
GOATSUCKERS					
Lesser Nighthawk			rSt	oFT	uST
					rFT
Common Poorwill			uWV	rST	xFT
SWIFTS					
Chimney Swift					rST
Vaux's Swift	xST	oFT	uFT	uFT	oFT
		oST	oST	oST	oST
White-throated Swift	rST	uR*	cR*	uSR*	oSV
HUMMINGBIRDS					
Anna's Hummingbird	cSR*	oST	uR*	rST	oST
		xFT		oFT	oFT
Costa's Hummingbird	rST		oST	rST	oST
	rSV		rFT	rSV	rFT
Rufous Hummingbird	xST	xFT	xWV		uST
		xST	xST		xFT
Allen's Hummungbid	cR*	cR*	cR*	cR*	oFT
					oST
KINGFISHERS					
Belted Kingfisher	oWV	oV	uWV	uWV	uWV
					xSV
WOODPECKERS					
Lewis' Woodpecker		rWV	uWV	xFT	xFT
Acorn Woodpecker	xST	rWV	cR*	rWV	xFT
Yellow-bellied Sapsucker			oWV		
Red-breasted Sapsucker	rWV	uWV	uWV	xFT	
Northern Flicker	uWV	uWV	cR*	uWV	uWV

					xSV
TYRANT FLYCATCHERS					
Olive-sided Flycatcher	oST		oFT	xST	uST
Western Wood-Pewee	uST	uST	oST cST	uST	oFT cST
Willow Flycatcher		uFT	cFT	uFT	uFT
Hammond's Flycatcher	rST	xST	oFT	oST	uST
Dusky Flycatcher				oFT	uFT
Gray Flycatcher				rST	oST
Western Flycatcher	cST	cSR*	uSR*	rSR*	cST
Black Phoebe	cFT				cFT
Say's Phoebe	uR+	cR*	uSR*	uWV	uWV
	cWV	vWV	cWV	cWV	cWV
	xSV				
Ash-throated Flycatcher	oST		uSR*	uST	cST
	oFT			cFT	cFT
Cassin's Kingbird	xST	rV	xFT	oFT	rST
					oFT
Western Kingbird	oST	oST	uST	oST	uST
		xFT	uFT	oFT	uFT
Scissor-tailed Flycatcher	xST			rST	xST
LARKS					
Horned Lark	aR*	aR*	aR*	oWV FR	aR*
SWALLOWS					
Purple Martin			xFT		rST
Tree Swallow	xST	oST		xFT	oST
	xFT				
Violet-green Swallow	xSV	xFT	xST	xST	oST
		xSV	xSV	xFT	
Northern Rough-winged Swallow		xST	xST		oST
	xFT	oFT			
Cliff Swallow	xST	xST	oST	oST	oSV
	xFT	xFT	rFT	oFT	
Barn Swallow*	cSR	cSR	cSR	cSR	uSR
JAYS, CROWS					
Scrub Jay*			cR		
Clark's Nutcracker			rWV		
Common Raven	FR	aR*	aR*	uR	FR
	oV				xST
BUSHTITS					
Bushtit			cR*	xSV	
NUTHATCHES					
Red-breasted Nuthatch	uWV	uWV	uR*	xFT	oST
					oFT
White-breasted Nuthatch			rWV		

CREEPERS

Brown Creeper rWV oWV

WRENS

Rock Wren*	cR	cR	uR	uR	uR
Canyon Wren			rR		
Hermit Warbler	oST	oST	oST	cST	cST
	xFT	uFT	uFT	oFT	oFT
				xWV	
Palm Warbler	rFT	xFT	oFT		xST
	xST				oFT
Blackpoll Warbler		xST	oFT	xFT	rST
		rFT			oFT
Black-and-white Warbler	xFT	xST	xST		oST
			xWV		rFT
American Redstart	xST	oFT	oFT	xST	rST
	xFT			oFT	oFT
Ovenbird					oST
					oFT
Northern Waterthrush		xFT	rFT	xST	rST
MacGillivray's Warbler	xFT	oFT	oST	oST	uST
			oFT	oFT	uFT
Common Yellowthroat	uWV	oFT	uWV	oFT	oST
		xWV	xSV	xST	xSV
					oFT
Wilson's Warbler	uST	uST	uST	uST	uST
	uFT	uFT	uFT	cFT	cFT
			xWV		
Yellow-breasted Chat	xST	xFT	xFT	xST	oST
				xFT	xFT

TANGERS

Summer Tanger			xSV		rST
Western Tanger	oST	oST	oST	uST	uST
	oFT	uFT	uFT	uFT	cFT

GROSBEAKS, BUNTINGS, SPARROWS

Rose-breasted Grosbeak	xFT		rST		uST
					oFT
Black-headed Grosbeak	uST	oST	cSR*	uST	cST
	oFT	oFT	xWV	uFT	uFT
Blue Grosbeak	xST	oFT	rST		oST
			rFT		rFT
Lazuli Bunting	oST	oST	uST	cST	cST
		oFT	uFT	uFT	uFT
Indigo Bunting	xST			rST	uST
					oFT
Green-tailed Towhee	xST		oFT	oFT	oST
	xFT		xWV		oFT

Rufous-sided Towhee	oFT	cR*	cR*	oWV	uFT
	xST				rWV
Rufous-crowned Sparrow*			cR	uR	
Chipping Sparrow	uST	cSR*	cSR*	cSR*	uST
	uFT		xWV		cFT
Clay-colored Sparrow			xFT	xFT	oFT
					xST
Brewer's Sparrow				xST	xST
				rFT	rFT
Vesper Sparrow		oFT	oFT	oFT	oST
					uFT
					oWV
Lark Sparrow		uFT	xST	oST	oST
		oWV	cWV	xSV	oFT
				uFT	
Black-throated Sparrow			xFT	xST	oST
				oFT	rFT
Lark Bunting					rFT
Savannah Sparrow	cWV	cWV	cWV	uST	cWV
				cFT	
Grasshopper Sparrow			uSR*	xST	rST
Fox Sparrow	oWV	oWV	cWV	oST	oWV
				oFT	
Song Sparrow	aR*	aR*	uR*	xFT	FR
Lincoln's Sparrow	oST	oFT	uWV	oWV	oWV
	oFT	xWV			
Golden-crowned Sparrow	uWV	cWV	aWV	cWV	cWV
White-crowned Sparrow	cWV	aWV	aWV	aWV	aWV
Dark-eyed Junco	oST	cWV	cWV	oST	uST
				cFT	cFT
Chestnucollared Longspur					rFT
ORIOLES, BLACKBIRDS					
Bobolink	xST	xFT		oFT	oST
	rFT				oFT
Red-winged Blackbird		oST	uR*	oFT	oST
		oFT			oFT
Tricolored Blackbird		xFT	oST		rST
Western Meadowlark*	cR	aR	cR	cR	cR
Yellow-headed Blackbird	rFT	oST	oST	oST	oST
		oFT	oFT	oFT	oFT
Brewer's Blackbird	oST	oST	oST	oST	oST
	oFT			oFT	oFT
Brown-headed Cowbird	oFT	uWV	uWV	oST	uST
	xST			uFT	uFT
Hooded Oriole	xST	xFT		oFT	oST
					oFT

	Northern Oriole	oST	xST oFT	oST oFT	oST uFT	uST uFT
FINCHES	Purple Finch	xST	oWV	uWV		oST
	House Finch	aR*	aR*	cR*	cR*	FR oV
	Red Crossbill			oV		
	Pine Siskin		xST	uWV	oST oFT	rWV
	Lesser Goldfinch	uSR*	cR*	cR*	xST uFT	oST uFT
	Lawrence's Goldfinch	xST	oST	oST	oST	oST
			oFT	oFT	oFT	oFT
				xWV		
	American Goldfinch	xWV xSV	oWV	oWV		rST
OLD WORLD SPARROWS	House Sparrow	xST	xST FR	xST		oST xFT

ACCIDENTAL SPECIES

Pied-billed Grebe (SMI, SRI)	Least Flycatcher (SRI)
Least Storm-Petrel (SMI)	Eastern Flycatcher (SMI, SRI, SBI)
Brown Booby (SMI)	Bank Swallow (SMI, SBI)
American White Pelican (AI)	American Crow (SRI, AI)
Great Egret (SRI)	American Dipper (SCI)
Snowy Egret (SRI, SCI, SBI)	Gray Catbird (SCI)
Northern Shoveler (SRI, SCI)	Bendire's Thrasher (AI, SBI)
Lesser Scaup (SRI, AI)	Red-throated Pipit (SMI, SCI)
Harlequin Duck (SMI)	Gray Vireo (SBI)
Black Scoter (SMI, SRI, SCI)	Philadelphia Vireo (AI, SBI)
Common Golden Eye (SRI, SCI)	Red-eyed Vireo (SBI)
Black-shouldered Kite (all islands)	Lucy's Warbler (SCI)
Swainson's Hawk (SCI)	Northern Parula (SMI, SBI)
Rough-legged Hawk (SCI, SBI)	Cape May Warbler (SRI, SBI)
Prairie Falcon (SRI, SCI, SBI)	Black-throated Blue Warbler (SMI, SRI)
Black-necked Stilt (SCI)	Black-throated Green Warbler
American Avocet (SCI)	(SMI, SCI, SBI)

Lesser Yellowlegs (SCI)
Upland Sandpiper (SBI)
Red Knot (SMI, SRI)
Wilson's Phalarope (SBI)
Pomarine Jaeger (SRI, SCI, AI, SBI)
Ring-billed Gull (SMI, SCI, SBI)
Thayer's Gull (SMI, SCI, AI)
Glaucous Gull (SMI)
Caspian Tern (SRI)
Artic Tern (SRI, SCI)
Craveri's Murrelet (SBI)
Horned Puffin (SMI, AI)
Spotted Dove (SBI)
Ringed Turtle-Dove (SBI)
Flammulated Owl (SBI)
Great Horned Owl (SBI)
Black Swift (SCI, AI)
Calliope Hummingbird (SBI)
Nuttall's Woodpecker (SMI, SRI, SCI)
Northern (Yellow-shafted) Flicker (AI, ABI)

Blackburnian Warbler (SCI, SBI)
Graces's Warbler (SCI)
Bay-breasted Warbler (SRI, SBI)
Kentucky Warbler (SBI)
Canada Warbler (SRI)
Painted Redstart (SCI)
Dickcissel (SBI)
Anerican Tree Sparrow (SCI)
Black-chinned Sparrow (SCI, SBI, AI)
Sage Sparrow (SCI, SBI)
Swamp Sparrow (SCI)
White-throated Sparrow (SCI, AI, SBI)
Harris' Sparrow (SBI)
McCown's Longspur (SBI)
Lapland Longspur (SRI, SBI)
Rusty Blackbird (SRI, SCI)
Scott's Oriole (SCI, AI)
ANACAPA ISLAND- AI SAN MIGUEL ISLAND- SMI
SANTA CRUZ ISLAND- SCI SANTA BARBARA ISLAND-SBI

SANTA ROSA ISLAND- SRI

Appendix C

Island Rat Eradications Worldwide

Species	Island	SIZE (HA)	Technique	Reference
<i>R. norvegicus</i>	Cox, Canada	10	Brodifacoum	Kaiser et al. 1997
<i>R. norvegicus</i>	Otata, NZ	15	Brodifacoum & 1080	Veitch & Bell 1990
<i>R. exulans</i>	Korapuki, NZ	17	Brodifacoum	Veitch & Bell 1990
<i>R. rattus</i>	Great Bird, Antigua	20	Brodifacoum	K. Lindsay pers. comm.
<i>R. rattus</i>	Tawhitinui, NZ	21	Brodifacoum	Taylor 1993
<i>Rattus rattus</i>	Ille Aux Aigrettes, Mauritius	25	Brodifacoum	B. Simmons, pers. comm.
<i>R. rattus</i>	Somes, NZ	32	Brodifacoum	Veitch & Bell 1990
<i>R. norvegicus</i>	Titi, NZ	32	Brodifacoum	Veitch & Bell 1990
<i>R. exulans</i>	Double, NZ	32	Brodifacoum	Veitch & Bell 1990
<i>R. norvegicus</i>	Lucy, Canada	40	Brodifacoum	Buck 1995
<i>Rattus exulans</i> <i>Rattus rattus</i>	12 Islets in the New Caledonia Group	48.5	Brodifacoum	B. Simmons, pers. comm.
<i>R. norvegicus</i>	Rasa, Mexico	60	Brodifacoum	J. Ramirez pers. comm.
<i>R. norvegicus</i>	Ailsa Craig, UK	>60	Warfarin	B. Zonfrillo, pers. comm.
<i>Rattus exulans</i>	Onoeo, Pitcairn Group, Pacific	62	Brodifacoum	B. Simmons, pers. comm.
<i>Rattus rattus</i> <i>Mus musculus</i>	Flat Island, Mauritius	67	Brodifacoum	B. Simmons, pers. comm.
<i>R. rattus</i>	San Roque, Mexico	70	Brodifacoum & Bromethalin	Tershy & Croll 1996
<i>Rattus exulans</i>	Ducie, Pitcairn Group, Pacific	74	Brodifacoum	B. Simmons, pers. comm.
<i>Rattus exulans</i>	Raratoka (Centre Island), NZ	86	Brodifacoum	B. Simmons, pers. comm.
<i>R. norvegicus</i>	Stanley, NZ	100	Brodifacoum aerial spread	Buckle & Fenn 1992
<i>Rattus rattus</i>	Bird Island, Seychelles	101	Brodifacoum	B. Simmons, pers. comm.
<i>R. norvegicus</i>	Mokoia, NZ	133	Brodifacoum	Veitch & Bell 1990
<i>Rattus exulans</i>	Long Island, NZ	142	Brodifacoum	B. Simmons, pers. comm.
<i>Rattus exulans</i>	Putauhini, NZ	144	Brodifacoum	B. Simmons, pers. comm.
<i>R. norvegicus</i>	Breaksea, NZ	170	Brodifacoum	Veitch & Bell 1990
<i>R. norvegicus</i>	Whale, NZ	173	Brodifacoum	Veitch & Bell 1990
<i>Rattus exulans</i>	Inner Chetwode, NZ	195	Brodifacoum	B. Simmons, pers. comm.
<i>R. norvegicus</i>	Brown, NZ	200	Bromadiolone	D. Veitch pers. comm.
<i>Rattus exulans</i> <i>Rattus norvegicus</i>	Whakaterepapanui, Puangiangi and Tinui, NZ	220	Brodifacoum	B. Simmons, pers. comm.

<i>R. norvegicus</i>	Ulva, NZ	259	Brodifacoum	Taylor 1993
<i>R. rattus</i>	St. Paul, Indian Ocean	800	Brodifacoum aerial spread	T. Micol pers. comm.
<i>R. norvegicus</i>	Kapiti, NZ	2000	Brodifacoum aerial spread	D. Veitch pers. comm.
<i>R. norvegicus</i>	Langara, Canada	3000	Brodifacoum	Kaiser et al. 1997

Appendix D (McChesney et al. 2000)

EXECUTIVE SUMMARY

The Department of Fish and Game (Habitat Conservation Planning Branch) sponsored the Humboldt State University and U.S. Geological Survey to conduct an assessment of potential nesting habitat for Xantus' Murrelets (*Synthliboramphus hypoleucus*) and other small, crevice-nesting seabirds at Anacapa Island, California, in 1997. Both ground and boat techniques were used to search for nests and estimate the number of potential nest sites. We focused on the upper portions of West Anacapa since this islet appeared to possess a considerable amount of accessible, potential habitat. A total of 1,510 (range = 848-1,303) potential nest sites for Xantus' Murrelets and other similar-sized crevice-nesting seabirds (e.g., Cassin's Auklet *Ptychoramphus aleuticus*) were estimated (not including potential sites in sea caves). The majority of sites were on West Anacapa Island (53.8%), followed by East Anacapa (27.5%) and Middle Anacapa (18.6%) islands. Of these potential sites, 91% were in rock crevices and 9% were in shrubs (mostly Island Buckwheat *Eriogonum grande*). A large proportion of potential nesting habitat occurred in the steep, largely inaccessible slopes and cliffs of the island, particularly on the north side. Sixty-two percent of sites were estimated from either ground or boat surveys, and 38% of sites were counted directly from ground surveys. About 100 additional potential nest sites may occur in sea caves at Anacapa Island, but these were not fully assessed. The remains of 23 eggs at 20 nest sites was the only evidence obtained of murrelet nesting in 1997. Eighteen nests were in sea caves on the West and Middle islands, and two nests were in rock crevices among the cliffs of the West and East islands. Of the 23 eggshells found, 9% were determined to have hatched, 56% had been rodent-depredated, and 35% had unknown fates.

The remains of a rodent-depredated Cassin's Auklet eggshell found in Pinnacle Cave (West Anacapa) represented the first documented nesting record for this species on Anacapa Island. No evidence of nesting by storm-petrels (*Oceanodroma* spp.) was obtained. A large but unmeasured proportion of potential rock crevice sites showed evidence of use by introduced Black Rats (*Rattus rattus*). Rat predation probably has been the main cause for long-term decline in the breeding population of Xantus' Murrelet and possibly other seabird species on Anacapa Island. Other factors that may have contributed to decline have been predation by feral cats (*Felis catus*, now extirpated) and mortality from oil pollution. We estimated only 50-200 breeding pairs of Xantus' Murrelets on Anacapa Island in 1997. These numbers appear low relative to the amount of potential habitat and to numbers that likely bred in the past. In the absence of rats, we consider that several hundred to low thousands of breeding pairs of murrelets could breed at Anacapa Island, based on potential habitat available. Thus, Anacapa Island could be a major colony if restored. Further studies using a variety of techniques are needed to more fully assess population sizes of Xantus' Murrelets and other seabirds, and to assess impacts of small mammals and other threats to seabirds at Anacapa Island. Conservation measures, especially the eradication of rats, likely would enhance murrelet and other seabird populations on Anacapa Island.